

542894

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
5 August 2004 (05.08.2004)

PCT

(10) International Publication Number  
**WO 2004/066297 A1**

(51) International Patent Classification<sup>7</sup>: **G11B 20/00**,  
H04N 1/32, G06T 1/00, H04N 7/26, H03M 13/19, 13/00

(21) International Application Number:  
PCT/IB2004/050050

(22) International Filing Date: 23 January 2004 (23.01.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
03075226.5 23 January 2003 (23.01.2003) EP

(71) Applicant (for all designated States except US): **KONIN-  
KLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL];  
Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KALKER, Anto-  
nius, A., C., M.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656  
AA Eindhoven (NL). **WILLEMS, Franciscus, M., J.**  
[NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven  
(NL).

(74) Agent: **SCHMITZ, Herman, J., R.**; Prof. Holstlaan 6,  
NL-5656 AA Eindhoven (NL).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

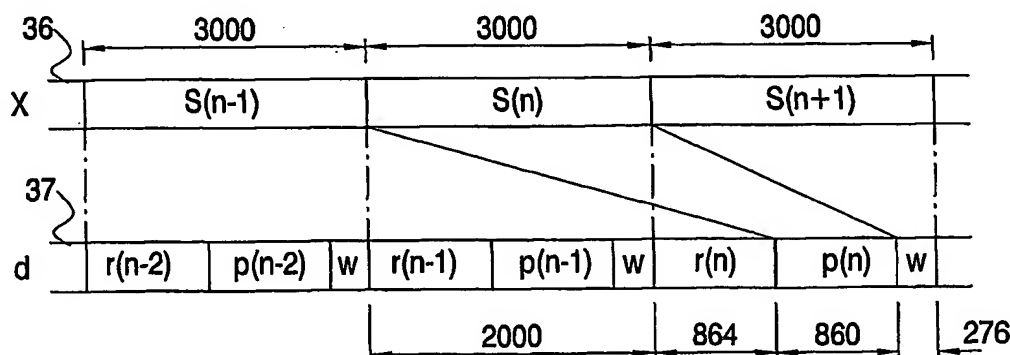
(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-  
pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,  
GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK,  
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,  
ML, MR, NE, SN, TD, TG).

**Published:**

- with international search report
- before the expiration of the time limit for amending the  
claims and to be republished in the event of receipt of  
amendments

For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: **LOSSLESS DATA EMBEDDING**



(57) Abstract: Many methods for reversible watermarking (embedding schemes that allow perfect reconstruction of the original host signal) are highly fragile in the sense that the slightest modification of watermarked content prohibits the recovery of both the original signal as well as the embedded auxiliary data. In order to obtain robustness against transmission or channel errors, the embedding method according to the invention accommodates error correction data in a portion of the data embedding capacity. In an advantageous embodiment, the host signal (36) is segmented in segments, and error correction data (p(n)) for a segment (S(n)) is accommodated in data (37) being embedded in a subsequent segment (S(n+1)) along with restoration data (r(n)) for reconstructing the host signal. The remaining portion of the embedding capacity is used for payload (w).

WO 2004/066297 A1